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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,990	02/20/2002	Buddy D. Ratner	920010.40001	1736

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EXAMINER

PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,990

Applicant(s)

RATNER ET AL.

Examiner

Marianne L. Padgett

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 42-49, 51-53, 56-73, 75-81 and 84-97 is/are pending in the application.
- 4a) Of the above claim(s) 70 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 42-49, 51-53, 56-69, 71-73, 75-81, 84-97 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/21/05 has been entered.
2. Applicant's stated on page 10 of their response of 12/21/04 that they were deleting the unintended dash in claims 85, line 2 before "controlled" however while claim 85 is labeled "(Currently Amended)" it contains no changes and still reads "-a controlled...".
3. Claims 42-48, 51-53, 56-69, 71-73, 75-81 and 84-97 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

See the rejection of section 5 of the action for 12/21/04 with the following additional discussion.

The citations provided on p. 11 of the 12/21/04 response correspond to specific sections within that part of the specification already reviewed and cited by the examiner, which are ALL directed to the specific techniques of electrostatically spraying molecules, which may be considered with the illustrated apparatus of fig. 2 to from a beam, but this very specific example is NOT considered to provide support for the claims of using ALL ionized molecular beams or all ion beams that contain molecules, such as ion cluster beams, etc. Such broad scope is not easily and casually enabled by a specification that never mentions the word "beam". Applicants'

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citation of the col. 4 quotation from Smith et al (6,107,628), which describes reference #320, the ion funnel in fig. 2, confirms the examiner's previous assessment that the particular disclosed apparatus will produce a type of ion beam, but does NOT enable broadening of scope to include other types of ion beams, such as ion cluster beams, or beams made for instance of molecular oxygen or other purely gaseous sources, etc., all of which applicants' very broad claim language is including without adequate support by the original specification. A specific type of molecular ion beam that derives its beam form a liquid solution source is a far cry from support for all ionized molecular beams! Note that the claim 49 as amended is removed from this rejection.

With respect to claim 88, applicants' citation of fig 2 and specifically p. 8, lines 5-8 describing "ion deposition chamber 225", "plasma reactor chamber 410" and "gate 230" which can close off the 2 chambers provides the needed support and removes that aspect of the New Matter rejection. Fig. 1 is too schematic to add meaningfully to the discussion.

With respect to "a first portion of an object" (emphasis added), the cited lines on p. 9-10 had no mention nor support of having only part of an object in the vacuum system (and not the rest of it) the first time the examiner read these section, and she still does not find it there. That is might be obvious to pass a continuous substrate through a differentially pumped air to vacuum interface, does not provide support to claim it, if it is NOT actually disclosed, hence this remains New Matter.

Applicants cite p.11, lines 5-8 to support their addition of "intact" as a modifier for molecules for claim 93. Absolutely nothing in this statement indicates that the molecules deposited are the one started with in presumably (as it is not specified) the source solution for the deposition. The ionized molecules deposited, may have reacted with each other, and still

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produced an ionized deposit of molecules, with other ions present. The examiner sees no support for the latest addition to the claim of "substantially pure" for describing "intact molecules". Is it also suppose to come from page 11? If so, it is even less supported.

For supporting separation of any ionized molecules in any gas, applicants' cite the specific example of separating ionized molecules that were supplied in a solvent, from the vaporized (? and ionized?) solvent and "dry gas", presumably carrier gas. This still does not provide support of the scope of the claims as written, for much the same reason as discussed concerning the molecular ion beam. For example, the examiner sees no support that would encompass separating O_2^+ molecules out of a O_2/Ar plasma and creating a beam thereof for delivery to the substrate. Thus New Matter is continued to be considered to be encompassed by the claims as written, as they are broader than the scope of the enabling disclosure.

4. Claim 45 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 45 requires generation of ionized molecules by some techniques that do not appear capable of this. For example, FAB is by definition an atomic not a molecular process.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States;

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 42-43, 46, 56-57, 68, 77, 79-80 and 86 are rejected under 35 U.S.C. 102(b) as being anticipated by Andra (5,645,897), as discussed in section 9 of the 12/21/04 action.

Applicant's arguments concerning any film of Andra consisting of atoms or molecules formed from the gaseous fluid surrounding the object is noted, and while Andra's teachings definitely included that possibility, applicant is directed to claim 1 of Andra where "a reactive gaseous fluid which is to react with the surface" is claimed, then claim 5 where "said fluid is provided as spatially homogenous...molecular ion beams directed towards said surface..." where activating energy according to Andra's claim 1 will have been supplied to both the surface (substrate) and the fluid (homogenous molecular ion beam) via ions or plasma. As per Andra's

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claims 3 or 4, coating or deposition is taught so these molecular ions are considered to be taught to impinge and deposit on the surface as claimed. If other gases or ions present may also deposit and react, that is an included possibility in applicants' claim 42, due to "comprising the molecules in an ionized state..." which also includes the possibility of other components or reactants being present (just not solvent, which Andra's homogenous beam also will not have). However, Andra does NOT require that the molecular ion beam react with any other gases, only that it interacts with the surface.

Note the typo with respect to claim 77 was corrected, and the various potential differences shown in the figures to guide ion beams at the surface read on electrostatic lenses.

7. Claims 47-48, 51, 52, 58, 61-64, 75-76, 78, 87 and 93 -96 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andra as discussed in section 10 of the 12/21/04 action.

With respect to applicants' arguments on claims 93 & 95, the teachings of Andra while not using the terms "substantially pure intact molecules" does state that a "homogeneous molecular ion beam" is interacted with the surface, hence since the general meaning of "homogenous" is that it is of uniform structure or composition, one of ordinary skill in the art would have expected the molecular ion beams to be composed of a single molecular components of like charge. To achieve this, it would have been obvious to one of ordinary skill that standard separation techniques from other non-homogenous gaseous components could have been expected to have already occurred, in order to produce the taught homogenous molecular ion beam. Note that part of making any ion beam will involve some sort of controlling of its kinetic energy level, hence this new limitation is considered a basic requirement of producing any ion

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beam or inherent in the ion beam formation process. Alternately, potentials and bias applied in Andra's deposition chamber as illustrated in Fig. 1-6, will control KE levels of all ions present. Applicants have not claimed how it is controlled, just that it is.

With respect to whether or not molecular ions from Andra's beam are intact when deposited on the surface, no requirements are made, hence as Andra is a generic process teaching, not directed to any particular chemical effect, it would have been obvious to one of ordinary skill when using Andra's techniques for taught depositions to use reagents according to desired results. Therefore where desired results require reaction, while the ionized molecules may arrive intact, they won't remain so, but where the molecule supplies the desired deposition material, then intact would have been obvious and possible with the taught low KE options. The present claims are too generic to provide any more significant or exclude such obviousness, and do not exclude reacting after arrival on/at the surface.

8. Claims 42, 46, 56, 61, 67 & 80 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Noda et al (5,374,613), as discussed in section 12 of the 12/21/04 action, which was written as a 102/103 concerning molecule cluster ion beams.

Applicant object to Noda et al, since the results of Noda et al process is to produce oxide coatings, concluding that therefore when the ion beams, such as a cluster ion beam, strike the surface in the presence of active oxygen it is no longer a molecular. The examiner notes that applicants' claims as written do NOT exclude the molecules reaction to form something else after they are deposited on the surface of the substrate. The nature of a cluster ion beam, is that it contains molecules, both ionized and not, which would have to a substantial extent arrived at the

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surface intact, then spread thereover due to their inherent mobility, after which they would react with the present activated oxygen to form the oxide film. Therefore, with use of ionized cluster beams of the source material for other than oxygen for these deposition processes, applicant's broad cryptic claims will encompass Noda et al, because they do NOT exclude the ionized molecules reacting after they physically deposit on the surface. Applicants' claims are too general. They DO NOT require the resultant film or final film to be made of molecules as supplied by the ionized molecular beam, only for the molecules to at least initially deposit on the substrate as the molecules. Any thing may happen to them thereafter, and still be encompassed by the claims as written.

9. Claims 47-48, 51-52, 62-63, 77-78, 87 and 95-96 are rejected under 35 U.S.C.

103(a) as being unpatentable over Noda et al as applied in section 13 of the 12/21/04 action.

10. With respect to applicant's misstatement of the examiner's position on p. 17 of the 12/21/04 response, the examiner has NEVER stated "that any reference using electrospray discloses a beam of ionized molecules". It was quite clear in the examiner discussion that any electrospray process using a similar or analogous configuration to that of applicants' electrospray process would be considered to read on (ion) beams.

Applicants are incorrect in saying that Morozov et al (6,350,609 B1)'s drying all occurs on the substrate. Only when "wet" electrospray is preformed, is this true, however a 'dry' electrospray (col. 15, lines 4-30) is taught where dry nanoclusters and biomolecules are deposited onto the substrate, however this electrospray technique still uses solutions to form the spray reagent, and employs humidity conditions and dry gas to separate the solvent from the biomolecules, such that beam its self, at least at initiation is not solvent free. The concern of

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whether the resultant deposit is an opaque film or single molecules has to do with the biomolecule concentration in the sprayed solution, not if its deposited wet or dry. More careful reading of both references and action is suggested.

Note while for Morozov et al (609)'s 'dry' electrostatic spraying, the beam(s) start out containing solvent, by the time they reach the substrate surface they must be substantially solvent free, hence the beam as it is directed and impacts on the surface reads on the requirements of applicants' claims, hence the rejections that use Morozov et al (609) in their combinations will be maintained, as the claims due to their broad phrasing are still inclusive of processes taught therein. Note that even claim 49, which is the most specific for separating molecules and solvents, encompasses separating the solvent by Morozov et al's dry electrospray technique, which appears to use evaporative effects as the beam(s) go towards the substrate.

Further note the advantages of faster drying protecting biomolecules, such as proteins (col. 16), easy patterning techniques, uses in various deposition environments including vacuum, etc. (col. 18), continue to provide motivation for employing the technique of Morozov et al in the applied primary references.

11. Claims 42-43, 45-49, 51-53, 56-56, 67-69, 71-73, 75-81, 84-87 & 93-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galin et al (5,944,753), as discussed in section 12 of the 4/26/04 action and Morozov et al (609) as applied in section 15 of 42/21/04 and discussed above.

Note that concerning substantially "pure" molecules, this can have various meaning, (1) that they are all molecules, type unspecified, (2) the molecules whatever they are, have no contaminants; (3) that they are only one type of molecule; etc... The combination only appears to

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suggest that molecules are deposited, so at least the broadest possible interpretation is covered.

Given the desired end use, substantially no contaminants would have been expected to be present, thus the new limitation is not considered to add significant difference with the prior art.

12. Claims 42-43, 45-49, 51-53, 56-69, 71-73, 75-81 & 84-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hostettler et al (5,849,368), as discussed in section 13 of 4/26/04, and Morozov et al (609) discussed in section 15-16 of 12/21/04 and section 10-11 above.

13. Claims 42-49, 51-53, 56-69, 71-73 & 84-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ragheb et al (5,824,049), in view of Morozov et al (609 B1) as discussed in section 17 of the 12/21/04 action and in sections 10-11 above.

Also note that the taught electrostatic deposition in Ragheb et al (col. 17, lines 45-47) may be by "a fluid mixture or dry power of the bioactive material or by any other appropriate method", and that the following paragraph (lines 50-57) discusses that desirability of removing the volatile fluid from the bioactive material "in any suitable way, for example, by allowing it to evaporate", hence Morozov et al (609)'s particular electrospray process via a fluid mixture that when dry sprayed evaporates the volatile solvent before deposition is consistent with the requirements of this primary reference, which suggest use of such appropriate methods with evaporation techniques, and supports statements of obviousness of record, including with the new limitations, especially as Morozov et al compare their technique with conventional uses that dry on the substrate.

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14. Claims 93-94 and 97 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The use of relative terms that lack clear metes and bounds in the claims or in a definition in the specification is vague and indefinite. As seen in the discussion of section 11, "pure" is lacking in clear metes and bounds, nor did applicants appear to provide any citation in the specification of where it is supported, and no disclosure to clarify or define the language was found by the examiner. While the examiner may make assumption about what applicant's intend, due to the ambiguous meaning of this relative term, it lacks clarity. Claim 93 requires "substantially pure, intact molecules", but molecules of what? As they are plural, they can be molecules of multiple different compounds, and long as they are all desired compounds one might consider them 'pure'. While the examiner guesses that applicants intended only a single species of molecule, a guess is not clear meaning, nor is the guess necessitated.

15. Applicant's arguments filed 4/21/05 and discussed above have been fully considered but they are not persuasive.

The examiner notes the presence of an interview request in the scanned file, however during action preparation had neither the time to arrange or have an interview before having to turn in her action.


16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on Monday-Friday from about 8:30 am to 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. L. Padgett/af
July 12, 2005
July 27 & 28, 2005



MARIANNE PADGETT
PRIMARY EXAMINER